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Hamilton Street Railway Company

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MAINTENANCE AND STORAGE FACILITIES INVESTIGATION

February, 1979

MAINTENANCE & STORAGE FACILITIES INVESTIGATION
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Hamilton Street Railway Company

HSR Hamilton Street Railway Company

MAINTENANCE AND STORAGE FACILITIES INVESTIGATION

February, 1979

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The Hamilton Street Railway Company

18 Wentworth St. N.
HSR
Founded 1873
Hamilton, Ontario L8L 5V1

The Honourable James W. Snow,
Minister of Transportation & Communications,
Ontario,

and

Councillor P. O. Valeriano,
Chairman,
Hamilton-Wentworth Transit Commission.

Gentlemen:

The Study entitled "Maintenance and Storage Facilities Investigation" for The Hamilton Street Railway Company has now been completed. The Report consolidates previous reviews of problems arising concurrently in various functions at the Wentworth St. base as congestion has intensified rapidly. It has both confirmed the urgency of certain immediate needs and has also projected requirements to be met in the future.

The stated purpose "to determine the facilities required to accommodate adequately by modern standards the present and future transit fleet, with necessary support functions, principally by opening a second base of operations on a south-central Mountain site to relieve the severe congestion on the Wentworth Street North premises" is met by this Report. The Technical Advisory Committee has reviewed the progress of the Consultant's work at appropriate stages of the project. It should be noted that sketch layouts were prepared solely for the purpose of generating comparative cost estimates. They are not necessarily intended as a basis for design.

The Committee endorses the substance and findings of the Investigation and accordingly wishes to place before you the following recommendation for your consideration:

That the development strategy be adopted, and that all phases of the program be implemented and actively pursued, subject to financial capabilities.

Respectfully yours,

F. A. Cooke,
Chairman,
Technical Advisory Committee,
Maintenance & Storage Facilities
Investigation.

Hamilton, Ontario
February 21, 1979.

DeLCan
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CONSULTING ENGINEERS AND PLANNERS

February 20, 1979

Mr. F. A. Cooke, Chairman, and
Members of the Technical Advisory Committee,
Maintenance and Storage Facilities Investigation,
18 Wentworth Street North,
HAMILTON, Ontario, L8L 5V1.

Gentlemen:

Re: Hamilton Street Railway -
Maintenance and Storage Facilities
Investigation

The accompanying report is submitted in accordance with our agreement with The Regional Municipality of Hamilton-Wentworth dated October 17, 1978.

The report outlines a development strategy which represents a physically feasible and economically viable approach to meeting current deficiencies and future needs. The main thrust of the proposal has focused on opening a second base of operations and upgrading the existing Wentworth Street facilities. An implementation schedule is included to identify the timing required and to establish the required financial planning.

We acknowledge the co-operation and assistance provided throughout the project by the Technical Advisory Committee and The Hamilton Street Railway.

The opportunity of participating in this important investigation is greatly appreciated and we trust the findings will contribute toward the improvement and expansion of the transit maintenance and storage facilities.

Yours very truly,

DELCAN

D. Turvey, P.Eng.,
Manager, Hamilton Operations.

DT:mc

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1. SUMMARY

This report outlines the findings of The Hamilton Street Railway transit facilities investigation. The objective of the analysis was:

> *"to determine the facilities required to accommodate adequately by modern standards the present and future transit fleet, with necessary support functions, principally by opening a second base of operations on a south-central Mountain site to relieve the severe congestion on the Wentworth Street North premises."*

The investigation represents the conclusion of the planning studies initiated in 1977 to identify current deficiencies and develop an expansion programme.

1.1 INTRODUCTION

The need for immediate expansion of the maintenance, servicing, and storage facilities of The Hamilton Street Railway is clear. Recent studies have demonstrated that adequate space is lacking for efficient operation of the present fleet.

The Wentworth Street North property has virtually been unchanged over the past 30 years to keep pace with the major expansion of the fleet. The overcrowding which exists has affected the efficiency of personnel who are working in below-average conditions.

Given a 1977 fleet size of 271 vehicles when the investigation was carried out, a total facility area of approximately 236,000 square feet is recommended, including approximately 146,000 square feet of indoor storage space. In comparison, the present Hamilton Street Railway facilities total 97,300 square feet. Currently, the fleet totals 289 vehicles.

Of the existing buildings on the site, only the main building appears suitable for renovation. However, considerable improvement will be re-

quired to conform with present fire protection regulations, explosion venting requirements, and modern lighting standards.

The present shop equipment provided is considered in poor condition and outdated. The present building power distribution system is operating up to maximum capacity and only careful useage prevents overloading.

1.2 SCOPE OF THE INVESTIGATION

While the expansion needs are immediate, the provision of new facilities will involve significant capital expenditures. Consequently, a strategy was developed to respond not only to solving current congestion, but also to provide efficient and effective methods of meeting future requirements. Each time site improvements are required, it creates disruption in the operation and affects the service offered to the public. As much as possible, these disruptions should be minimized through a co-ordinated expansion programme.

The project was separated into two distinct phases:

Phase I: Development Strategy

This phase examined the future role of the Wentworth Street complex in relation to the anticipated needs of the transit operation to 2001.

Phase II: Immediate Implementation Schedule

This phase involved the preparation of a construction plan for the expansion of the transit facilities to 1986. Included in the analysis was the development of functional plans for both the Wentworth Street and Mountain sites. The functional planning activity included the estimation of costs suitable for budgeting purposes.

An immediate action programme was prepared to provide relief to the current congestion. This programme is compatible with

the suggested improvements to 1986.

1.3 THE REPORT

The report highlights the analysis completed in each phase of the investigation. Supporting technical material is contained in the interim reports submitted to and approved by the Technical Advisory Committee during the course of the project.

The findings and recommendations are expanded upon in the remainder of this section. Section 2 describes the development of the long-term expansion strategy, and the report concludes in Section 3 with an outline of the selected implementation programme.

1.4 FINDINGS AND RECOMMENDATIONS

Based on the analysis carried out in this investigation, the following list summarizes the major findings:

- the present facilities are inadequate to efficiently accommodate the present operation. The current space shortage is critical and immediate action is required to overcome the present deficiency specifically related to vehicle storage and the operations department.

- by 1986, the current fleet of 289 vehicles is expected to increase to 384 units. The present site area of 6.4 acres cannot be redeveloped to provide sufficient facilities for this fleet and, therefore, a second base of operations must be established. Given the expected magnitude and geographical distribution of the growth in transit services, a second site positioned in the south-central Mountain area represents an ideal location to efficiently meet the expansion of transit services in the Region.

- renovation of the present Wentworth Street facilities to accommodate up

to 170 vehicles represents a cost-effective solution compared to abandoning this site in favour of a suburban location. The investigation indicates a potential saving of approximately $2,200,000 compared to a relocation option.

Based on these findings, we recommend the following:

1. A development strategy be adopted to establish a second base of operations on the Mountain and to retain the present Wentworth Street North property. The Mountain site will provide for the major maintenance and overhaul facilities for the diesel operation. The present site will provide all maintenance operations for the trolley fleet and an inspection, servicing and storage function for the diesel equipment related to the transit service located in the lower City of Hamilton. As the Mountain site will represent the major base of operations, the administrative functions of the Company will be located on this property.

2. a) Commence immediately to acquire 15 to 20 acres of property on the Mountain for the construction of a new facility. This site area will accommodate fleet expansion to 1986. Additional area may be considered at this site or at another location to provide for fleet growth to 2001.

   b) Obtain suitable temporary bus storage area for 100 vehicles to relieve the current vehicle storage shortage. Approximately 3.5 acres will be required. The area will be needed for approximately 2 years consistent with the construction period for the new facility.

   c) If necessary, after the relocation of the 100 vehicles and corresponding operating staff, obtain suitable leased office accommodation to provide for the administration department. When relocation of these functions is complete, transfer the operations department to the vacated space.

3. Once the property transaction for the Mountain site is finalized, commence design of a new facility to house approximately 220 vehicles. The estimated cost is projected to be $8,950,000, with construction complete within 2 years.

4. After the new Mountain facility is opened, transfer the total diesel operation to the new site if necessary to permit the efficient renovation to the present Wentworth Street property. The schedule and scope of the work will be tailored to the funds available. The estimated cost of the total renovation is $4,260,000. In comparison with the provision of a new facility, the renovation of the existing property represents a potential saving of $2,200,000.

2. DEVELOPMENT OF EXPANSION STRATEGY

This section of the report describes the evaluation of expansion options based on projected passenger ridership derived from anticipated growth within the Region. The ridership estimates are translated into fleet needs and corresponding facility requirements.

2.1 FUTURE GROWTH WITHIN TRANSIT SERVICE AREA

The Regional Planning Department's projections indicate the population of the Hamilton-Wentworth Region will increase from 396,200 in 1971 to 465,200, an increase of 15 percent, by 1986, and 550,000 by the year 2001, an increase of 36 percent. Table 2.1 summarizes the projected population statistics. The growth of employment within the Region is given in Table 2.2.

The effects of the projected development on the provision of transit services are summarized below:

(i) The expected growth rate is modest and thus rapid expansion of the transit services is not indicated.

(ii) The major growth will take place in the urbanized Mountain area in Hamilton and the Town of Stoney Creek. As a result, the major expansion of transit services can be expected in the southerly and easterly parts of the urban transit service area.

(iii) with the major growth in employment projected in the central area of the City, the routing system will continue to be focused on this district.

Table 2.1

PRESENT AND PROJECTED POPULATION DISTRIBUTION

URBAN TRANSIT SERVICE AREA

Municipality	Area	1971 Population	% Total Urban Area	1986 Population	% Total Urban Area	2001 Population	% Total Urban Area
Hamilton	- West Hamilton	18,700	5.2	20,000	4.8	20,000	4.1
	- Central District	72,700	20.5	68,800	16.5	75,700	15.5
	- Lower City	54,900	15.4	54,700	13.1	55,500	11.3
	- East Hamilton	56,200	15.8	64,100	15.4	65,800	13.4
	- Mountain	101,600	28.6	129,000	30.9	165,000	33.7
	- Total	304,100	85.5	336,600	80.7	382,000	78.0
Stoney Creek Urban Area	- Lower Stoney Creek Urban Area	19,100	5.4	32,000	7.7	38,000	7.8
	- Saltfleet Community	1,900	0.5	13,000	3.1	30,500	6.2
	- Total	21,000	5.9	45,000	10.8	68,500	14.0
Ancaster Urban Area		11,300	3.2	12,400	3.0	14,300	2.9
Dundas		19,000	5.4	23,100	5.6	25,000	5.1
Total Urban Transit Service Area		355,400	100.0	417,100	100.0	489,800	100.0
Regional Total		396,200		465,200		550,000	

Table 2.2

DISTRIBUTION OF PRESENT AND PROJECTED EMPLOYMENT TO MAJOR EMPLOYMENT AREAS

Employment Area	1971 Employment	% Regional Total	1986 Employment	% Regional Total	2001 Employment	% Regional Total
. Hamilton Central District	48,400	31.5	70,000	32.4	95,000	32.8
. Bay Front Industrial Complex	48,100	31.3	50,000	23.1	57,300	19.8
. McMaster University	5,800	3.8	8,500	3.9	10,200	3.5
. Stoney Creek Industrial Park	6,400	4.1	15,600	7.2	23,100	8.0
. Mountain Sub-Regional District	1,100	0.7	4,500	2.1	8,300	2.8
. Mountain Industrial Park	200	0.1	6,500	3.1	12,000	4.1
. Total	110,000	71.5	155,100	71.8	205,900	71.0
. Total Regional Employment	153,300	100	216,100	100	290,000	100

2.2 FLEET REQUIREMENTS

Vehicle requirements are predicated, to a large degree, on the population served and the rate of useage. The current rate of ridership within the urban transit service area was examined to determine an appropriate basis for estimating future ridership rates and thus future vehicle requirements.

One of the basic transportation objectives of the Region's Official Plan is to encourage greater use of public transit. Various factors influence the rate of transit ridership, including:

- relative cost of transit versus operating an automobile; and
- the accessibility or travel time of transit relative to the auto.

Various policies of the Region can impact the relative cost of using transit relative to the operation of the private auto. These policies may relate to limiting the expansion of roadways in specific corridors focused on the central area, limiting core area parking supply, increasing parking charges, and artificially reducing transit fares through increasing municipal support.

Some of these policies, to a greater or lesser degree, are in effect now. Major changes and their resulting impact require an extended period of time. Within the short-term period to 1986, a major change in the rate of ridership is not anticipated without a major influence such as gasoline prices rising sharply.

Based on the foregoing, the projection of 1986 vehicle requirements was based on the current trend in ridership statistics. We believe this provides a sound basis for fleet estimation as the past trend in the transit ridership rate appears stable.

While the short-term expansion requirements are based on the 1986 fleet requirements, a longer term is desirable in order to provide suitable expansion capability. The immediate impact relates to the size of the property purchased on the Mountain. The site should be sufficiently large to allow expansion of the initial facility to accommodate 250 to 300 vehicles.

To provide an indication of the facility needs to 2001, the fleet requirements to the end of the century were projected based on current trends. The difficulty in projecting fleet size over this long term is recognized. However, it does provide a conservative indication of the sizing capability of the initial facility construction.

The estimated vehicle requirements for 1986 and 2001 are compared with the present fleet below:

	1978	1986	2001
City of Hamilton Excluding Mountain Area	130	156	190
Mountain Area, Dundas, Ancaster, Stoney Creek	73	147	227
Scheduled Peak Period Extras	40	47	65
Spare Equipment	28	34	48
Total	271	384	530

2.3 DESCRIPTION OF DEVELOPMENT OPTIONS

The projection of vehicle needs to 1986 suggests a fleet size of 384 vehicles is appropriate for planning purposes. Applying current M.T.C.

guidelines for facility sizing as given in Table 2.3 results in the following:

Operation		Area (Sq. Ft.)
. Service Lane	-	7,100
. Maintenance Area, including Parts Storage	-	89,800
. Indoor Storage	-	202,500
. Administration/Operations Area	-	30,600
Total Facility Area	-	330,000 square feet
Minimum Total Site Area Required	-	20 acres

The application of current standards for the sizing of the required facility clearly demonstrates the present Wentworth Street site of 6.4 acres is inadequate to accommodate the needs of the total fleet to 1986.

The operation of the trolley fleet is expected to continue over the long term. The capital investment in the electric distribution system is large and the relocation costs would be prohibitive. Consideration was given to the possibility of abandoning the present site in favour of a new suburban site for the trolley operation in order to take advantage of possible differences in real estate values. A preliminary market assessment report completed by Chambers & Company Limited indicated marginal differences between the value of the present site and serviced suburban industrial land. Due to the probable high relocation costs associated with moving to a new site and the depressed market for residential/commercial development, the retention of the present site offers the more cost-effective option.

Based on the foregoing, the development options focused on the range of alternatives available with the operations split between the present site and a second location.

The past decision to develop a second base of operations south of the

Table 2.3

GUIDELINES FOR SIZING OF TRANSIT MAINTENANCE FACILITIES
MINISTRY OF TRANSPORTATION AND COMMUNICATIONS

Operation	Dimension Guideline
. Service Lane	- Minimum 95' x 25' - 1 Lane per 150 Vehicles to 180 vehicles
. Maintenance Area	
Bays	- 17' x 60'
Number of Bays	- Fleets over 100 Vehicles, 8% of Fleet - Fleets under 100 Vehicles, 10 - 15% of Fleet
Number of Hoists	- Fleets over 200 Vehicles, 6% of Fleet - Fleets between 100 - 200 Vehicles, 8% of Fleet - Fleets under 100 Vehicles, 10% of Fleet

For Fleets over 100 Vehicles, Total Area Equivalent to 235 square feet per Vehicle
For Fleets under 100 Vehicles, Total Area Equivalent to 250 square feet per Vehicle

Within the total area, the allowance for Parts Storage is as follows:

For Fleets over 100 Vehicles, 25 square feet per Vehicle
For Fleets under 100 Vehicles, 35 square feet per Vehicle

. Indoor Storage	- 530 square feet per Vehicle
. Administration/Operations Area	- 80 square feet per Vehicle

Escarpment is valid in view of the projected distribution of the vehicle assignment. With the major expansion of transit service anticipated in the area south of Limeridge Road and in the area east of the Red Hill Creek Valley, a south-central Mountain location represents an ideal location to minimize the non-revenue operating costs of serving these areas.

Given the constraints on the expansion of the transit facilities, two basic development options are available:

Option 1 - retain the present site for trolley operation only. All diesel equipment would be housed on the Mountain site.

Option 2 - expand the present site to accommodate the trolley fleet and the diesel fleet related to the population area located north of the Escarpment within the City of Hamilton.

The major considerations in comparing alternative development strategies include the following:

- capital cost: This includes construction, property acquisition, and site preparation.
- operating cost: A major consideration is the non-revenue mileage costs associated with each site. Operating costs related to heat, light, and power are comparable for each location and thus do not affect the selection decision.
- future expansion: In order to avoid major disruption to the daily operation, the strategy should provide adequate flexibility to accommodate future expansion. A planning horizon of 2001 has been assumed for this criteria.

- site compatibility:	Compatibility with adjacent existing and planned development with respect to traffic generated, noise impacts, and aesthetics.

A preliminary assessment of the options was prepared to highlight the differences between the options under the above considerations. The assessment indicates Option 2 represents the more attractive alternative for the following major reasons:

- Option 1 does not maximize the capability of the present Wentworth Street site. We are doubtful if the residual property remaining would be attractive to other uses given the continued use of the site for transit and the desirability of maintaining access for the vehicles from both King Street and Wilson Street.

- The non-revenue mileage costs would undoubtedly be higher under Option 1 as all diesel vehicles operating below the Escarpment would be required to operate greater distances entering and leaving service compared to Option 2.

- Past experience indicates an optimum facility sizing for 250 to 300 vehicles is desirable. With Option 1, the new site would have to be sized for 454 vehicles or an additional third site would be needed. Under Option 2, a desirable facility size would result on both sites.

In summary, we recommend an expansion strategy which incorporates the following features be adopted:

- Establish a new base of operations on a south-central Mountain site to accommodate the major repair and servicing of the diesel fleet. As the major part of the total operation will be provided from the site, the administrative function should be located at the new facility. Based on current experience,

we recommend a site area of 15 acres to 20 acres be purchased for the construction of the new facility to accommodate growth to 1986. The property should be rectangular in shape with a minimum side dimension of 800 feet. Further property may be considered at this site or at another location to provide for fleet growth to 2001.

- retain the present Wentworth Street site for the total trolley fleet and the balance of the diesel fleet related to the operation north of the Escarpment. Renovation should be carried out with a view to achieving improved operations in the most cost-effective manner.

3. PREPARATION OF IMPLEMENTATION PROGRAMME

In this section of the report, the suggested implementation plan is outlined together with an immediate action proposal to provide relief to the present overcrowding on the Wentworth Street North premises.

3.1 IMPLEMENTATION PLAN TO 1986

The development of the implementation plan focused on the preparation of representative layouts for both sites consistent with the development strategy for each location. This level of detail is required to ensure the immediate action proposals are consistent with future planning and cost estimates are realistic for budgeting purposes.

The implementation plan has been separated into four major components as follows:

1. Adopt the development strategy for the expansion and upgrading of the maintenance, operations, and administrative facilities.

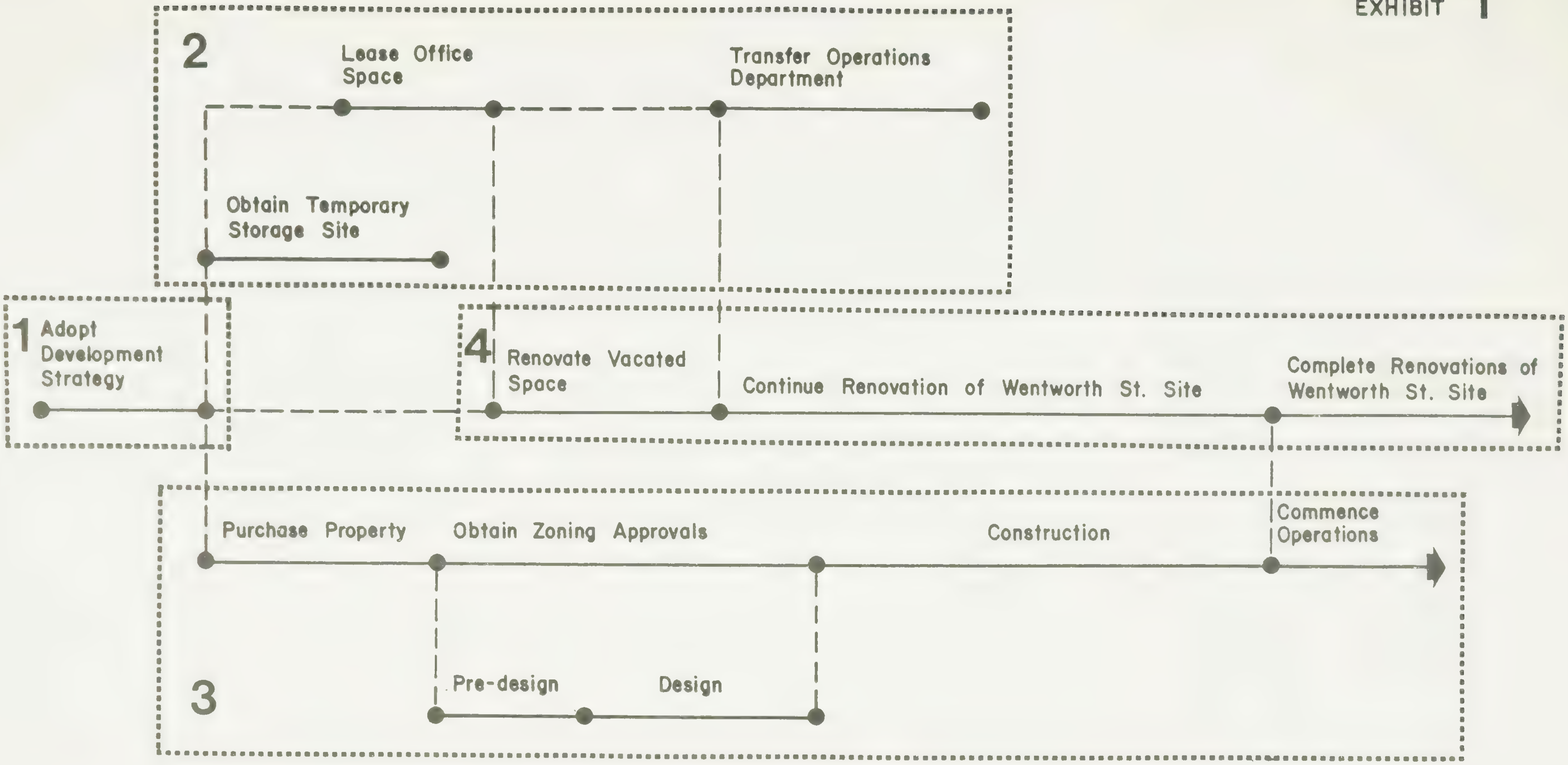
2. Proceed immediately to relieve the current deficiencies specifically related to present vehicle storage space and current operations facilities.

3. Obtain suitable property in a south-central Mountain location and proceed to construct a major new transit operations centre.

4. Commence renovation of the Wentworth Street facilities to upgrade these facilities to modern standards.

Exhibit 1 illustrates the sequence and inter-relationship of these major components and provides an outline of the major activities within each. The remainder of this section of the report provides further detail

EXHIBIT 1


1
Adopt Development Strategy
2
Lease Office Space
Transfer Operations Department
Obtain Temporary Storage Site
4
Renovate Vacated Space
Continue Renovation of Wentworth St. Site
Complete Renovations of Wentworth St. Site
3
Purchase Property
Obtain Zoning Approvals
Construction
Commence Operations
Pre-design
Design

H.S.R. Maintenance and Storage Facilities Investigation

SEQUENCE OF MAJOR ACTIVITIES IN IMPLEMENTATION PLAN

regarding each component to support the proposed implementation plan.

1. *Adopt Development Strategy*

The adoption of a general guideline is essential to provide management with a framework within which the current deficiencies can be eliminated and the future growth of the operations can be efficiently accommodated.

The development strategy described in Section 2 has been based on a thorough examination of the viable options and the selected plan represents a physically feasible and economically viable approach to meeting both current deficiencies and future needs. We recommend the Company adopt this development strategy.

2. *Relief of Current Congestion*

Previous studies carried out in 1977 indicated two major deficiencies in the present facilities on Wentworth Street:

(i) the present vehicle storage area is deficient by approximately 100 vehicles by modern standards; and
(ii) of the current space allocation for staff, severe overcrowding is apparent in the operators' facilities.

Based on these findings, we suggest suitable vehicle storage space and operator report facilities be leased. A site area of approximately 3.5 acres will be needed. Preliminary investigations carried out by Chambers & Company indicate there are five possible sites suitably located and zoned for this purpose. Negotiations can commence immediately to confirm the availability of these locations.

If the relocation of the operating staff corresponding to the shift of 100 vehicles to the temporary site does not provide sufficient

relief to the present overcrowding, we suggest suitable office accommodation be leased for the administrative function housed on the second floor. Approximately 6,500 square feet will be needed. An initial review by Chambers & Company indicates there are a number of suitable locations available. After the administrative staff has been relocated, the vacated space can be economically renovated to provide an efficient layout for the operations department.

3. *Construction of New Transit Centre*

The Company should proceed as quickly as possible to build a new facility on the Mountain. Delays in opening this new garage will result in increased costs associated with extended leasing of temporary facilities.

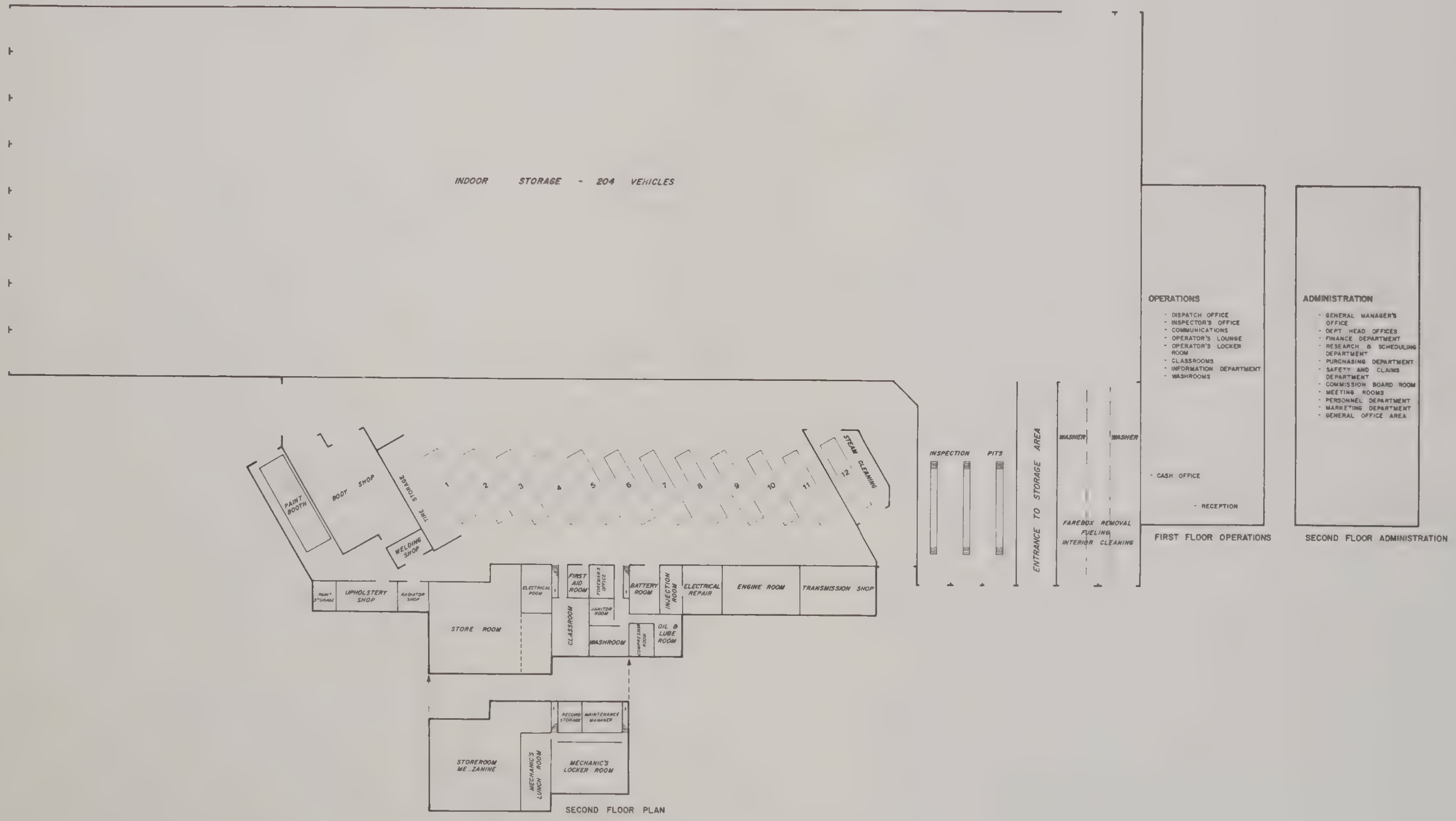
The assignment of vehicles to the Mountain site projected to 1986 is as follows:

. diesel fleet	- regular service	147
. diesel fleet	- scheduled extras	47
. diesel fleet	- spare equipment	19
	Total	213

Under the development strategy, this facility will provide for the administrative facilities and major maintenance and overhaul requirements for the diesel fleet in addition to servicing, inspection, and storage for the portion of the diesel fleet housed at this site.

Based on the above assumptions, a preliminary estimate of the facility needs was prepared. The representative functional plan is illustrated in Exhibit 2.

2



H.S.R MAINTENANCE AND STORAGE FACILITIES INVESTIGATION

REPRESENTATIVE FUNCTIONAL LAYOUT
MOUNTAIN SITE

. Administration/Operations Area	22,500 sq. ft.
- administrative offices, meeting rooms	
- dispatch/communications	
- classrooms	
- cash office/accounting/payroll/ vaults/file storage	
- lunch room/cafeteria	
- general stores	
. Maintenance/Repair Area	67,600 sq. ft.
- 14 bays with hoists for engine, transmission, tire shop, steam cleaning and body shop	
- 3 inspection bays	
- paint shop with hoist	
- paint booth	
- welding shop	
- sheet metal shop	
- radiator repair shop	
- transmission/motor room	
- electrical repair shop	
- upholstery shop	
- parts storeroom with mezzanine	
- foreman's office	
- locker room, lunch room, and washrooms on mezzanine level	
. Service/Inspection Lane	4,500 sq. ft.
- fueling, fare box removal	
- interior cleaning	
- exterior cleaning (2 washers)	
. Indoor Storage (40-foot vehicles)	114,800 sq. ft.
Total Building Area	209,400 sq. ft.
Total Site Area	15 to 20 acres

The preliminary functional plan has been developed using current experience and practice in the layout of this type of facility. It includes provision for articulated vehicles and office accommodation for C.C.L. operations. An allowance of approximately 2,500 square feet is included for C.C.L. personnel. In our opinion, it is representative and provides a sound basis for cost estimation and the subsequent pre-design of the facility. Once the details are available regarding the specific site location and dimensions, the pre-design of the facility can begin.

Exclusive of property purchase and possible costs associated with the extension of municipal services, the total cost is estimated to be $8,950,000. This is based on an average cost of $42.60 per square foot to build and equip the facility. We believe this estimate would be valid for a 1979 or early 1980 tender call.

The time required to commence operations from this facility is dependent, to a large degree, on the period required to obtain the property and receive the necessary zoning approvals. However, assuming the property purchase could be finalized by the end of April, and a rezoning could be obtained within 4 months, construction could begin in September of this year. The estimated pre-design and design activities can be completed within 14 weeks comparable to the assumed rezoning application period.

4. *Wentworth Street Property*

The approach for the functional planning of improvements to the Wentworth Street property was to maximize the use of the existing facilities where feasible and cost effective. As indicated, the architectural and electrical - mechanical inspection of the present buildings and equipment showed the following:

- the main building is the only structure on the property which warrants expenditures to upgrade

and improve. The present trolley servicing building, the operations building, and the foundry building are not suitable for renovation to modern standards.

- the present shop equipment is in poor condition and outdated. Most major pieces of equipment require replacement, including the bus washing equipment and the bus hoists. The present heating, ventilation and lighting systems do not meet modern standards and codes. The present building power distribution system is operating up to maximum capacity and only careful useage prevents overloading.

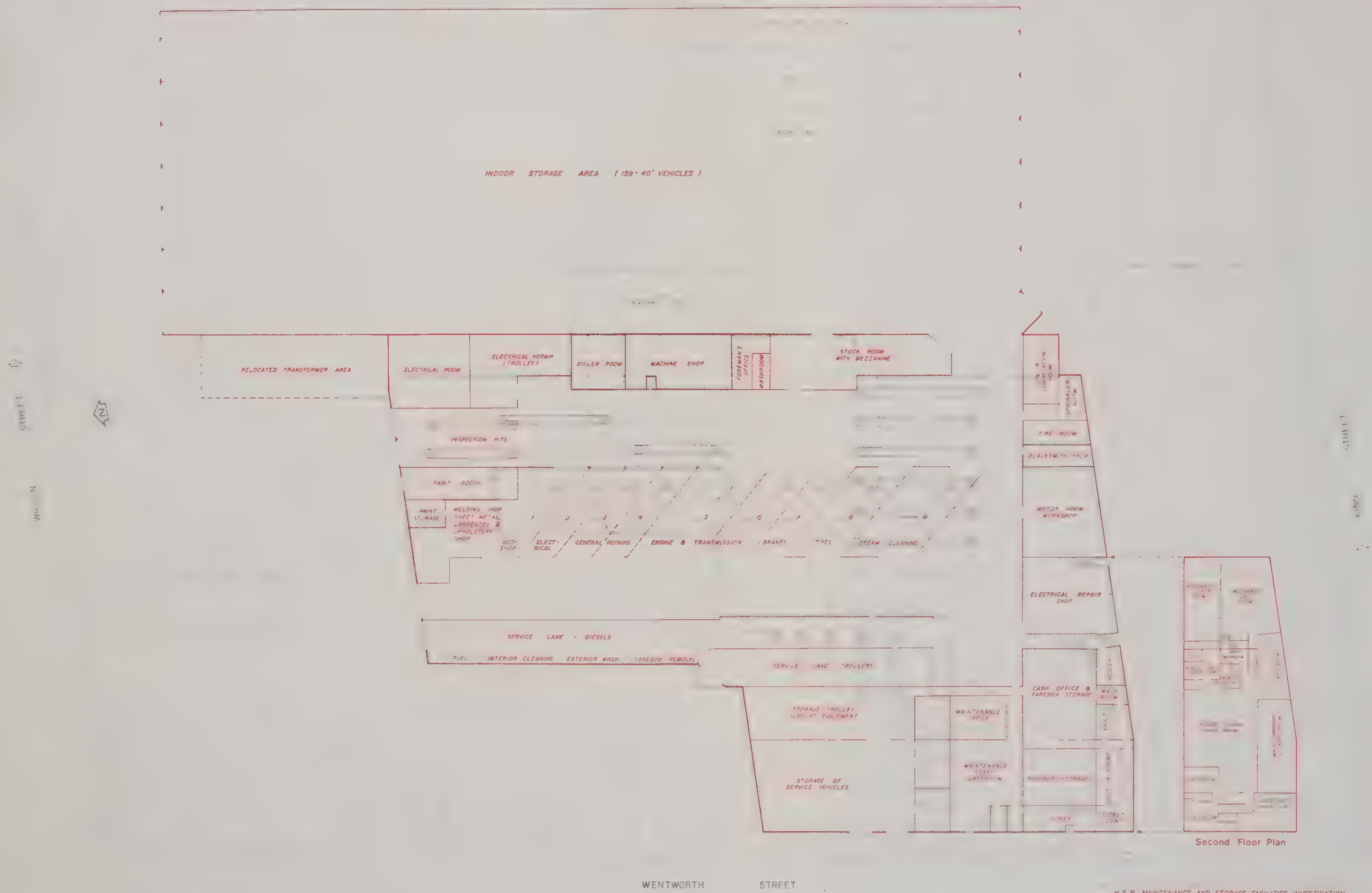
The assignment of vehicles to this site projected to 1986 is given below:

. trolley fleet	- regular service	62
. diesel fleet	- regular service	94
. trolley fleet	- spare equipment	5
. diesel fleet	- spare equipment	10
	Total	171

As the congestion on this property is critical, the above estimate assumes all scheduled extras would be dispatched from the Mountain site. The role for the present site will be to function as the complete operations centre for trolley equipment and primarily as a servicing, inspection, and light maintenance facility for diesel equipment.

A representative layout was prepared and reviewed with staff to ensure the necessary features were provided and to clarify the scope of the improvements needed. The layout is illustrated in Exhibit 3. The significant modifications incorporated in the functional plan are listed below:

3



H.S.R. MAINTENANCE AND STORAGE FACILITIES INVESTIGATION

REPRESENTATIVE FUNCTIONAL LAYOUT
WENTWORTH STREET SITE

De Leuw Cather

- the present operations building, trolley servicing barn, and the foundry would be demolished. The present functions carried out in these buildings would be transferred to the main building in those areas vacated through the transfer of the head office administrative functions to the new Mountain site.

- the maintenance area would be revamped to provide sufficient work bays to accommodate the assigned fleet. The configuration of the maintenance area allows convenient access and work flow patterns to be developed equivalent to modern standards.

- new service lanes would be provided for fueling, washing, and fare box removal for both diesel and trolley equipment.

- a new indoor storage area would be provided for the total fleet assigned to the property. The new structure has been situated in the present storage yard. The configuration allows ideal internal circulation of the vehicles from the service lanes to the storage area.

- the complete replacement and upgrading of the electrical - mechanical equipment to meet modern standards.

As can be seen from reviewing the proposal, the structural renovation to the main building has been restricted to the removal and construction of internal walls in order to reduce both construction costs and disruption of the operation during construction.

The costs associated with this proposed plan total $3,810,000. The cost breakdown is given in Table 3.1. The estimate indicates the electrical - mechanical component represents a major portion of the costs.

Table 3.1

COST ESTIMATE
SUGGESTED IMPROVEMENTS TO WENTWORTH ST. FACILITIES

	Item	Estimated Cost
1.	Plumbing	$ 146,700
2.	Heating, Ventilation, Air Conditioning	238,100
3.	Equipment	232,600
4.	Washing Equipment	110,000
5.	Paint Booth Relocation	30,000
6.	Sprinkler Systems	170,000
7.	Electrical Services	231,000
8.	New Sub-Station and Electrical Room	380,000
9.	Miscellaneous Electrical - Mechanical	110,000
10.	Architectural Renovation	
	- Maintenance Area	810,000
	- Operations Area	55,000
11.	Indoor Storage Area	1,100,000
12.	Realignment of Trolley Overhead	196,000
	Sub-Total	$3,809,400
	Engineering and Contingencies	450,600
	Total	$4,260,000

Note: Costs given are representative for 1979 and should be reviewed at each major point in the implementation schedule.

Importantly, the proposal does represent a cost-effective solution compared to the option of complete reconstruction at another location. Current costs for a new facility to house a comparable fleet size would be approximately $6,460,000. This estimate is based on similar experience in Ottawa and Toronto for inspection and servicing facilities. The total facility area assumed was 136,200 square feet. The cost estimate was based on $40.00 per square foot with an allowance of $1,012,000 to recognize the added trolley requirements related to the sub-station and overhead construction, engineering and contingencies.

Exclusive of property costs, the modernization proposed for the existing property represents the most cost-effective strategy with potential savings of $2,200,000, compared with constructing a new facility at an alternate location. As indicated previously, the value of the present Wentworth Street North property is comparable to suburban industrial land and its sale would not provide a potential cost saving.

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